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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Thomas H. Barrows et al. Art Unit : 1653
Serial No. : 09/185,732 Examiner : J. Russel
Filed : November 4, 1998
Title : ADHESIVE SEALANT COMPOSITION

Commissioner for Patents
Washington, D.C. 20231

SURRENDER OF U.S. PATENT NO. 5,583,114

The Examiner recently indicated to Applicants that the claims pending in the above-captioned application are allowable.

Pursuant to the Offer to Surrender dated September 17, 1998, Applicant hereby surrender U.S. Patent No. 5,583,114. The original ribboned copy of the patent is enclosed.

Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date:

7-25-02



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The
United
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The Commissioner of
Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

Bruce Lehman

Commissioner of Patents and Trademarks

Melvinia Gary
Attest

5,583,114
Dec. 10, 96



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United States Patent [19]

Barrows et al.

[11] Patent Number: **5,583,114**[45] Date of Patent: **Dec. 10, 1996**[54] **ADHESIVE SEALANT COMPOSITION**[75] Inventors: Thomas H. Barrows, Cottage Grove;
Terry W. Lewis, Woodbury; Myhanh
T. Truong, Blaine, all of Minn.[73] Assignee: Minnesota Mining and
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Minn.

[21] Appl. No.: 281,473

[22] Filed: Jul. 27, 1994

[51] Int. Cl.⁶ A61K 38/00; A61K 39/00;
C07K 1/00[52] U.S. Cl. 514/21; 514/2; 514/4;
530/362; 530/363; 530/366; 530/830; 424/77;
424/78.02; 424/78.06; 424/179.1; 424/193.1;
424/194.1; 424/422; 424/423; 424/428;
525/54.1[58] Field of Search 514/21, 2, 4; 530/350,
530/362, 363, 366, 830; 424/77, 78.02,
78.06, 422, 423, 428; 524/54.1[56] **References Cited****U.S. PATENT DOCUMENTS**

2,688,610	9/1954	Ellis et al.	260/117
4,101,380	7/1978	Rubinstein et al.	530/350
4,163,097	7/1979	Baumann et al.	525/531
4,356,819	11/1982	Potaczek	128/156
4,416,814	11/1983	Battista	260/117
4,670,417	6/1987	Iwasaki et al.	514/6
4,692,462	9/1987	Banerjee	514/449
4,839,345	6/1989	Doi et al.	514/21
4,851,513	7/1989	Devore et al.	530/356
5,162,430	11/1992	Rhee et al.	525/54.1
5,385,606	1/1995	Kowanko	106/124

FOREIGN PATENT DOCUMENTS

0194807A3	9/1988	European Pat. Off.
2551660	3/1985	France
WO90/13540	11/1990	WIPO
WO92/02238	2/1992	WIPO
WO94/03155	2/1994	WIPO

OTHER PUBLICATIONS

Abuchowshi et al., *The Journal of Biological Chemistry*, vol. 252, No. 11, pp. 3578-3581, Jun. 10, 1977.
D'Urso et al., *Biotechnology Techniques*, vol. 8, No. 2, pp. 71-76, Feb. 1994.

Two-Component Fibrin Sealant Tissue® Kit Brochure.

Abstract, Abdella et al., "A New Cleavable Reagent for Cross-linking and Reversible Immobilization of Proteins", *Biochem. Methods*, 91:16228v, 1979.Kalman et al., "Synthesis of a Gene for Human Serum Albumin and Its Expression in *Saccharomyces cerevisiae*", *Nucleic Acids Research*, vol. 18, No. 20, 1990, pp. 6075-6081.Sleep et al., "The Secretion of Human Serum Albumin from the Yeast *Saccharomyces cerevisiae* Using Five Different Leader Sequences", *BioTechnology*, vol. 8, Jan. 1990, pp. 42-46.Sijmons et al., "Production of Correctly Processed Human Serum Albumin in Transgenic Plants", *BioTechnology*, vol. 8, Mar. 1990, pp. 217-221.Quirk et al., "Production of Recombinant Human Serum Albumin from *Saccharomyces cerevisiae*", *Biotechnology and Applied Biochemistry*, 11:273-287 (1989).D'Urso et al., "New Hydrogel Based on Polyethylene Glycol Cross-Linked with Bovine Serum Albumin", *Biotechnology Techniques*, vol. 8, No. 2 (Feb. 1994) pp. 71-76.

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[57] **ABSTRACT**

This invention is related to an adhesive composition which may be used to bond or seal tissue in vivo. The adhesive composition is readily formed from a two component mixture which includes a first part of a protein, preferably a serum albumin protein, in an aqueous buffer having a pH in the range of about 8.0-11.0 and a second part of a water-compatible or water-soluble bifunctional crosslinking agent. When the two parts of the mixture are combined, the mixture is initially a liquid which cures in vivo on the surface of tissue in less than about one minute to give a strong, flexible, pliant substantive composition which bonds to the tissue and is absorbed in about four to sixty days. The adhesive composition may be used either to bond tissue, to seal tissue or to prevent tissue adhesions caused by surgery.

17 Claims, 3 Drawing Sheets